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Danya M. Corkin

University of Houston-Downtown, corkind@uhd.edu

Adem Ekmekci

Rice University, ekmekci@rice.edu

Richard Parr

Rice University, rparr@rice.edu

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The Effects of the School-Work Environment on Mathematics Teachers' Motivation for Teaching: A Self-Determination Theoretical Perspective

Danya M. Corkin

University of Houston-Downtown, USA

Adem Ekmekci

Richard Parr

Rice University, USA

Abstract: Guided by self-determination theory, this study investigated the extent to which factors of teachers' school-work environments predict their self-efficacy and intrinsic value for teaching. Participants were 217 mathematics teachers working in Texas public schools. Results indicated that principals' autonomy support positively predicted teachers' self-efficacy and intrinsic value for teaching beyond years of teaching experience, mathematics background, and grade level taught. Moreover, the negative effects of school-work environments dominated by high-stakes testing on teachers' motivation for teaching were moderated by the level of autonomy support provided by the school principal.

Introduction

Understanding what malleable factors influence teachers to remain in the teaching profession is of great interest to educators and policymakers given international teacher shortages and high attrition rates, especially in the areas of mathematics and science and among teachers working in high-poverty schools (Ingersoll, Merrill, & Stuckey, 2014; the Organisation for Economic Co-operation and Development, 2011). To understand what factors influence teachers to choose and persist in teaching, a burgeoning area of research has examined their motivation for teaching (Hoy, 2008; Kitching, Morgan, & O'Leary, 2009; Low, Ng, Hui, & Cai, 2017; Watt & Richardson, 2007). To conduct this work, researchers have adapted motivation theories to explore the contextual and personal factors affecting teachers' motivation (Watt & Richardson, 2007). Research that combines theories of motivation in educational psychology with theory and practice in teacher education, however, remains scarce (Richardson & Watt, 2010). Moreover, little work has been devoted to examining the effects of contextual factors salient in the current school-work environments on teachers' motivation for teaching. These significant contextual factors include but are not limited to the emphasis of high-stakes testing, institutional autonomy, and instructional support systems. Contextual factors such as these may have a significant impact on teachers' approaches to instruction and their motivation for teaching (e.g., Hornstra, Mansfield, van der Veen, Peetsma, & Volman, 2015).

The researchers will expand this research area by examining the school-work environmental antecedents of two types of motivational beliefs: teaching self-efficacy and intrinsic value for teaching. These two types of motivational beliefs have emerged as consistent

predictors of career choice and persistence among both students and teachers (Watt, 2006; Watt & Richardson, 2007). In addition, they are considered as central to a strongly supported motivation theory that explains achievement-related choices and behaviors (Wigfield & Eccles, 2000). The school-work environmental antecedents of teacher motivation explored in this study are informed by self-determination theory (SDT), which posits that people have three basic needs: the need for autonomy, the need to relate to others, and the need for competence (Deci & Ryan, 1985). Work environments vary in the extent to which they foster or undermine these needs (Gagné & Deci, 2005).

This study will use school-work environmental indicators representing teachers' perceptions of the levels of autonomy provided by principals (principal autonomy support) and relatedness to their colleagues (person-environment fit) to examine the degree to which these facets of the environment predict their self-efficacy and intrinsic value for teaching. The researchers will also explore whether principals' level of autonomy support moderates the potentially negative effect that a high-stakes testing culture—deemed as a source of control (Hornstra et al., 2015)—has on teachers' motivation. The subsequent sections will discuss teachers' motivational beliefs and aspects of the school-work environment that may influence these beliefs.

Teachers' Self-Efficacy for Teaching

Teachers' self-efficacy for teaching has been defined as teachers' beliefs about their ability to successfully perform teaching tasks within particular contexts (Tschannen-Moran & Hoy, 2001). Teachers' self-efficacy for teaching has important implications for both teaching and student learning as numerous studies indicate that higher levels of self-efficacy for teaching are associated with instructional approaches that foster constructivist learning, greater student motivation, and higher academic performance (Anderson, Greene, & Loewen, 1988; Klassen & Tze, 2014; Stipek, Givvin, Salmon, & MacGyvers, 2001). Examining teacher self-efficacy within a social-cognitive framework (Bandura, 1986) has led researchers to explore antecedents of teachers' self-efficacy beliefs consistent with this theory such as their mastery experiences and vicarious learning through years of teaching and professional development experiences (Corkin, Ekmekci, & Papakonstantinou, 2015; Wolters & Daugherty, 2007). Few studies, however, have investigated malleable school contextual antecedents of teachers' self-efficacy for teaching (Tschannen-Moran & Hoy, 2007).

Intrinsic Value for Teaching

Intrinsic value has been defined as the enjoyment a person receives from performing a particular task or the subjective interest a person has for a particular subject (Wigfield & Eccles, 2000). This conceptualization of intrinsic value overlaps with intrinsic motivation as defined by Deci and Ryan (1985), individual interest as defined by Hidi and Renninger (2006), and enthusiasm as defined by Kunter and colleagues (2008). Intrinsic value for teaching, thus, may be described as the interest and enjoyment teachers feel towards teaching.

Intrinsic value for teaching is another motivational belief that is linked to various positive teacher practices such as self-regulatory teaching strategy use and high effort towards teaching

(Chatzistamatiou, Dermitzaki, & Bagiatis, 2014; Watt & Richardson, 2007). Moreover, intrinsic value for teaching is also associated with various positive professional outcomes, including aspirations to participate in professional development, aspirations to become a school leader, commitment to teaching, and teaching effectiveness (Kunter et al., 2008; Long & Hoy 2006; Watt & Richardson, 2007).

Given the numerous positive outcomes linked to teachers' level of intrinsic value for teaching, it seems critical to explore its antecedents. However, studies that have examined social influences on teachers' intrinsic value for teaching have focused on exploring the impact of friends and/or relatives (Watt & Richardson, 2007), whereas studies examining the influence of school-work environments on intrinsic value for teaching are scant.

The School-Work Environment: An SDT Perspective

SDT distinguishes between two types of motivation: autonomous motivation and controlled motivation (Gagné & Deci, 2005). Autonomy can be described as having the power to choose one's behavior whereas control can be described as being pressed to behave a certain way. According to SDT, work environments vary by the level of autonomy provided to employees. Work environments that support autonomy promote one's intrinsic value for work (Baard, Deci, & Ryan, 2004). Specifically, studies have found that the level of autonomy support provided by managers is associated with numerous adaptive psychological outcomes including job satisfaction, high work performance, and persistence (Baard et al., 2004; Deci, Connell, & Ryan, 1989; Gagné & Deci, 2005). Managers who foster an autonomy-supportive work environment recognize the views of their employees, guide employees in a non-controlling way, encourage employees to be proactive, and allow employees to make independent decisions (Gagné & Deci, 2005).

Prior studies demonstrate the importance of autonomy support in promoting intrinsic work motivation within business organizations (e.g., Gagné & Deci, 2005). In the education field, only a few studies have explored the effect of principal autonomy support on teachers' motivation for teaching within school organizations (Fernet, Guay, Senécal, & Austin, 2012). However, recent research highlights the critical role that principals have in teachers' work satisfaction and commitment to teaching (Simon & Johnson, 2015; Skaalvik & Skaalvik, 2011). Results from the few studies that have examined the effect of principal leadership on self-efficacy for teaching, however, have been mixed (Fernet et al., 2012; Tschannen-Moran & Hoy, 2007).

Thus, this study will extend the research on the role principals have in motivating teachers by examining a specific way in which principals express their leadership, namely by the amount of autonomy they provide their teachers. The researchers adapt the concept of manager autonomy support (Deci et al., 1989) to the school-work environment where principals act as 'managers' of a school (Simon & Johnson, 2015) and define principal autonomy support as the degree to which principals provide teachers with choices and opportunities to make decisions, are receptive to teachers' perspectives, and demonstrate confidence in teachers' work. The researchers hypothesize that principal autonomy support will have a positive effect on teachers' self-efficacy and intrinsic value for teaching given the mounting evidence indicating that environments fostering autonomous motivation promote intrinsic value for work (Gagné & Deci, 2005).

Person-Organization (P-O) Fit

According to SDT, the degree to which work climates foster relatedness among employees also contributes to intrinsic work motivation (Deci & Ryan, 1985). A concept similar to sense of relatedness in the workplace studied in organizational psychology is person-organization (P-O) fit (Youngs, Pogodzinski, Grogan, & Perrone, 2015). P-O fit has been examined within K-12 education research to study the degree to which the school-work environment provides teachers with a sense of relatedness with other teachers within their schools. Teachers' P-O fit perceptions are the extent to which they feel that other teachers at their school show concern towards them and the degree to which their goals and beliefs align with those of other teachers at their school (Pogodzinski, Youngs, & Frank, 2013; Youngs et al., 2015). P-O fit has been associated with teachers' sense of belonging, job satisfaction, and commitment to teaching (Pogodzinski et al., 2013; Skaalvik & Skaalvik, 2011; Youngs et al., 2015). However, research exploring whether P-O fit directly influences teachers' motivation for teaching remains scarce.

High-Stakes Testing and the Moderating Role of Principals

In contrast to autonomy-supportive work environments that allow employees to make their own choices and decisions, controlling work environments may constrain employees' ability to make independent decisions in the workplace. Factors within a school-work environment that may be deemed as controlling from a teachers' perspective are instructional time constraints, the imposition of state-mandated curriculum, and sanctions dependent on teacher and/or student performance (Hornstra et al., 2015; Jones & Egley, 2004; Ryan & Deci, 2000). Some researchers argue that the high-stakes testing movement has had a strong impact on the organizational climate of schools. Moreover, evidence exists that the emphasis on high-stakes testing has played a role in how teachers experience the work environment and their motivation for teaching (Au, 2011; Jones & Egley, 2004). Researchers suggest that the culture of high-stakes assessment leads to 'standardized' classroom practices that leave teachers feeling little control over their classrooms (Au, 2011; Popham, 2003). A qualitative study found that teachers felt controlled by high-stakes testing due to the pressure of being forced to narrow the academic curriculum and to teach to the test (Jones & Egley, 2004). Teachers in this study also reported that the emphasis on testing led them to feel less enjoyment towards teaching and undermined their ability to teach effectively (Jones & Egley, 2004).

The degree to which the culture of high-stakes assessments influence teachers' work motivation may be mitigated by the amount of instructional autonomy provided to teachers by their principals (Simon & Johnson, 2015). Qualitative data suggest that teachers' positive relationship with principals lessens the negative effect that high-stakes testing has on their job satisfaction (Noll, 2007). No studies identified to date, however, have quantitatively assessed the nature of the moderating effect a principal may have on the impact of high-stakes testing on teachers' motivation. Therefore, the researchers hypothesize that high levels of principal autonomy support will mitigate the potentially negative effects that a controlling school-work environment has on teachers' motivation for teaching.

Research Questions

Grounded in this review of the literature, two research questions will be addressed:

- (1) To what extent do teachers' perceptions of their school-work environment, namely their perceptions of their principals' autonomy support and their P-O fit, predict their self-efficacy for teaching and intrinsic value for teaching?
- (2) To what degree does the amount of autonomy support provided by principals moderate the effects of school-work environments emphasizing high-stakes testing on teachers' self-efficacy and intrinsic value for teaching?

Method

Participants

Participants were 217 K-12 in-service mathematics teachers (female = 78%) representing 21 school districts in Texas. The majority of teachers (82%) worked in high-poverty districts classified as school districts with more than 50% economically-disadvantaged students (Olson & Jerald, 1998). The racial/ethnic composition of teachers was 41% White, 26% African American, 20% Hispanic, 11% Asian, and 2% other. Teachers were grouped by whether they taught elementary (K–5; 49%), middle (6–8; 24%), or high school (9–12; 27%).

Procedure

K-12 teachers who were part of an existing network of teachers affiliated with Rice University School Mathematics Project, a mathematics professional development program in a large urban area in Texas, were invited to participate via e-mail. Teachers who provided consent to participate were entered into a raffle and five teachers selected received mathematics textbooks and classroom materials. To meet participation requirements, teachers had to verify they were currently teaching mathematics in a public school. Teachers meeting the criteria took a survey administered via Qualtrics. The survey included several sections: (a) demographics, (b) professional background, and (c) Likert-scaled items adapted from previous scales. These scales have been deemed valid and reliable and are detailed in the next section with their respective validating authors.

Measures

All survey items were on five-point Likert-scales ranging from 1 (strongly disagree) to 5 (strongly agree) with the exception of teachers' self-efficacy items which ranged from 1 (nothing) to 5 (a great deal) and high-stakes testing school-work environment items which ranged from 1 (not at all) to 5 (a great deal).

Motivational Beliefs

Teachers' sense of efficacy scale (TSES; Tschannen-Moran & Hoy, 2001) was used to measure teachers' self-efficacy in three related areas of teaching. The TSES 12-item short form was used to measure three dimensions of teacher self-efficacy (Klassen et al., 2009). The self-efficacy for instruction items capture teachers' beliefs about the extent to which they feel that they can successfully implement instructional and assessment strategies to address student needs. The self-efficacy for student engagement items assess the extent to which teachers feel confident about their ability to motivate and engage students in the learning process. The self-efficacy for classroom management items assess the extent to which teachers feel confident in their ability to discipline and manage students in their classrooms. These three dimensions were combined into one measure upon running an exploratory factor analysis (EFA) as results indicated the presence of only one factor.

Teachers' intrinsic value for teaching (4 items) assessed teachers' interest in and enjoyment for mathematics teaching. These items were adapted from Linnenbrink-Garcia and colleagues (2010) maintained-situational interest feeling measure. An example is, 'I enjoy teaching mathematics.'

School-Work Environment

The principal autonomy support scale was adapted from the six-item version of the Work Climate Questionnaire (Baard et al., 2004). Items were modified to assess teacher perceptions of their principal rather than a manager. Six items assessed the degree to which teachers felt that their principals provided teachers with opportunities to express their beliefs and ideas and demonstrated confidence in teachers' work.

The perceived P-O fit scale contained six items adopted from Pogodzinski and colleagues (2013) measure. This scale assessed the degree to which teachers believed that their goals, interests, and philosophies aligned with those of other teachers at their school. This scale also tapped into the extent to which teachers felt cared for by other teachers at their school.

In addition, the current researchers developed 10 items to examine the extent to which high-stakes testing was perceived as controlling the school-work environment. The development of these items was informed by qualitative research that identified ways in which high-stakes testing is perceived to control several facets of the school work-environment (Au, 2011; Jones & Egley; 2004; Jones et al., 1999; Thomas, 2005). Three master teachers, each having over 20 years of teaching experience, verified that items had adequate face validity.

Moreover, an EFA was conducted using maximum likelihood extraction with oblimin rotation as recommended by Costello and Osborne (2005). Results of the Scree test and Kaiser method used to estimate the number of factors indicated the presence of two factors (see Table 1). One item was omitted from further analysis because it did not load highly on either factor. Two items loaded on the first factor, which was labeled, 'High Stakes Testing Dictates Work Roles' (eigenvalue = 3.88). This factor directly assessed the extent to which teachers perceived high-stakes assessments as dictating the work of administrators and teachers at their schools. The remaining seven items loaded on the second factor, which was labeled, 'High Stakes Testing Pervades School Culture' (eigenvalue = 1.41). The second factor assessed the degree to which high-stakes assessments pervades several facets of the school-work environment—from how much teachers discuss high-stakes testing to how much high-stakes testing is considered in

instruction. These two factors accounted for 53.00% of the total variance (Tab. 1). The factors that emerged provide a significant representation of how the emphasis on high-stakes assessments are perceived as controlling that is consistent with previous research (Au, 2011; Jones & Egley, 2004; Popham, 2003).

| Items | Factor Loading | |
|--|---|---|
| | High Stakes Testing Dictates Work Roles | High Stakes Testing Pervades School Culture |
| High-stakes assessments dictate how administrators at my school approach their leadership roles. | .95 | -.02 |
| High-stakes assessments dictate how teachers approach classroom teaching at my school. | .73 | .08 |
| Teachers at my school discuss the number of high stakes assessments administered at my school. | .05 | .67 |
| Teachers at my school are held responsible when students perform inadequately on high stakes assessments. | .07 | .62 |
| Teachers at my school allocate a considerable amount of time for student test preparation. | -.02 | .63 |
| High stakes assessments create a competitive environment among teachers at my school. | .09 | .52 |
| Teachers at my school would be more productive if high-stakes were not attached to standardized assessments. | .03 | .52 |
| Teachers at my school take high-stakes assessments into account when planning for instruction | .21 | .48 |
| Administrators emphasize high-stakes assessments at my school. | .40 | .48 |

Note: N = 203. All factor loadings $\geq .45$ are bolded in the table.

Table 1: Final item factor loadings from pattern matrix of exploratory factor analysis with oblique rotation.

Results

Table 2 shows reliabilities of scales and means, standard deviations, and correlations among the variables of interest. Effect sizes were interpreted based on Ferguson's (2009) recommendations. Statistically significant correlations were found between facets of the school-work environment and teachers' motivational beliefs. Perceptions of principals' autonomy support were positively related to self-efficacy for teaching ($r=.30$) and math teaching interest ($r=.28$). P-O fit was also positively associated to self-efficacy for teaching ($r=.25$). These associations were all small but practically significant (Ferguson, 2009). Teachers' perceptions about the degree to which high-stakes testing pervaded or dictated the school-work environment were not associated with any of the motivational beliefs.

| Variable | α | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|----------|------|------|-------|--------|-------|-------|-------|-------|-------|------|-------|
| 1. Experienced teacher | --- | 0.80 | 0.40 | --- | | | | | | | | |
| 2. Middle school teacher | --- | 0.23 | 0.42 | -.04 | --- | | | | | | | |
| 3. High school teacher | --- | 0.27 | 0.45 | .00 | -.34** | --- | | | | | | |
| 4. Math undergraduate | --- | 0.25 | 0.44 | .04 | -.11 | .63** | --- | | | | | |
| 5. Principal autonomy support | .93 | 3.75 | 0.85 | .00 | -.16* | .04 | -.01 | --- | | | | |
| 6. Person-organization fit | .78 | 3.82 | 0.57 | -.04 | -.12 | .05 | .02 | .51** | --- | | | |
| 7. High-stakes testing dictates work | .84 | 3.60 | 0.91 | .13 | .02 | -.05 | -.04 | -.09 | -.09 | --- | | |
| 8. High-stakes testing pervades culture | .80 | 3.81 | 0.64 | -.09 | .12 | -.16* | -.14* | -.16* | -.01 | .47** | --- | |
| 9. Self-efficacy for teaching | .90 | 4.15 | 0.22 | .16* | -.01 | .00 | .06 | .30** | .25** | .03 | .07 | --- |
| 10. Intrinsic value for math teaching | .87 | 4.53 | 0.59 | .23** | -.08 | .14* | .13* | .28** | .13 | -.08 | -.03 | .47** |

Note: $N = 209$; listwise deletion was used to handle missing values; * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2: Cronbach's alphas, means, standard deviations, and Pearson correlations among the main variables.

Hierarchical multiple linear regression analyses (Table 3) were conducted predicting self-efficacy and intrinsic value for teaching from school-work environment dimensions representing autonomy and relatedness perceptions after controlling for professional background variables. The effect of professional background was controlled for because previous studies have indicated that teachers' level of experience, grade level of instruction, and content background knowledge in the subject they teach is associated with teachers' self-efficacy (Corkin et al., 2015; Wolters & Daugherty, 2007).

| Variable | Self-efficacy for teaching ^a | Intrinsic value for math teaching ^b |
|-----------------------------------|---|--|
| | β | β |
| Step 1 | | |
| Experienced Teacher | .16* | .22** |
| Math Undergraduate Degree | .09 | .07 |
| High School Teacher | -.07 | .08 |
| Middle School Teacher | -.02 | -.02 |
| Step 2 | | |
| Experienced Teacher | .16* | .22** |
| Math Undergraduate Degree | .09 | .07 |
| High School Teacher | -.07 | .09 |
| Middle School Teacher | .04 | .03 |
| Principal autonomy support | .23** | .27*** |
| Person-organization fit | .15 | .01 |

Note: β indicates standardized regression coefficient. $N = 212$. * $p < .05$. ** $p < .01$. *** $p < .001$. ^a $R^2 = .03$, $p > .05$ for Step 1; $\Delta R^2 = .11$, $p < .001$ for Step 2. ^b $R^2 = .07$, $p < .01$ for Step 1; $\Delta R^2 = .07$, $p < .001$ for Step 2.

Table 3: Summary of hierarchical linear regressions predicting teachers' self-efficacy and intrinsic value for teaching.

In the first step of the regression analyses, years of experience, and math background were entered as binary variables. Experienced teachers (greater than five years) were coded as '1.' Teachers who had an undergraduate degree in mathematics were coded as '1' as a proxy for their math content background. Grade level taught was dummy coded with the elementary teacher (K-5) variable serving as the reference. Thus, a variable representing high school teachers (9-12) and a variable representing middle school teachers (6-8) were also entered. These splits were consistent with teacher experience and grade-level groupings created in previous research (Wolters & Daugherty, 2007).

In the second step, the school-work environment variables were added. After controlling for teachers' professional background, principal autonomy support remained a significant predictor of the outcomes of interest. For the hierarchical regression analysis predicting self-efficacy for teaching, the model was statistically significant, $F(6, 211)=5.46, p<.001$, explaining 14% of the variation in teachers' self-efficacy for teaching. Principal autonomy support ($\beta=.23, p<.01$) was statistically significant, with teachers who reported receiving higher levels of autonomy support from their principals having higher levels of self-efficacy for teaching compared teachers who received lower levels of autonomy support from their principals. The hierarchical regression model predicting intrinsic value for mathematics teaching also emerged as statistically significant, $F(6, 211)=5.80, p<.001$, explaining 15% of the variation. Again, principal autonomy support ($\beta=.27, p<.001$) was a positive and statistically significant predictor of intrinsic value for teaching. The effects of principal autonomy support were small but practically significant for social science data (Ferguson, 2009).

Testing for Moderation Effects

Because the researchers hypothesized that the effect of teachers' perceptions of the high-stakes testing environment at their schools on their motivation may depend on the level of autonomy support provided by their principals, a series of two-step multiple linear regression analyses were also conducted to examine the moderating effect of principal autonomy support on the relation between teachers' perceptions of high-stakes testing within their school-work environments and each of the motivational beliefs (see Table 4). The first set of regression analyses included the variable capturing teachers' perceptions of the extent to which testing pervades the school culture in the first step as well as principal autonomy support. In the second step, an interaction term was entered according to procedures recommended by Aiken and West (1991), which included centering the lower-order term predictors before creating and entering the interaction term.

| Predictor variables | β Step 1 | β Step 2 |
|---|----------------|----------------|
| Step 1 | | |
| High-stakes testing pervades culture | .01 | .01 |
| Principal autonomy support | .29*** | .25*** |
| Step 2 | | |
| Principal autonomy support X High-stakes testing pervades culture | | .14* |
| R^2 | .08*** | .10*** |

Notes: N = 212. β indicates standardized regression coefficient. * $p < .05$. *** $p < .001$.

Table 4. Hierarchical regression predicting intrinsic value for math teaching: high-stakes testing pervades school culture as predictor

Of the first two regressions analyses, only the regression model with intrinsic value for mathematics as an outcome had a statistically significant interaction ($F(3, 211)=7.72, \beta=.14, p<.05$; Tab. 4). Higher levels of principal autonomy support moderated the effect of teachers' perceptions of high-stakes testing pervading the school culture on their intrinsic value for mathematics teaching. Because this interaction was statistically significant, a test of simple slopes was conducted to understand the nature of the interaction effect. Values representing one standard deviation above the mean and one standard deviation below the mean were used to plot

the interaction (Aiken & West, 1991). Figure 1 presents two simple regression lines of the regression of intrinsic value for teaching on perceptions of high-stakes pervading school culture as a function of two values of principal autonomy support. Teachers' perceptions of the pervasiveness of high-stakes culture at their schools had a negative relation with their intrinsic value for teaching when teachers perceived their principals as expressing low autonomy support ($b = -.11, p > .05$). Conversely, teachers' perceptions of the pervasiveness of high-stakes culture at their schools had a positive relation with their intrinsic value for teaching when teachers perceived their principals as expressing high autonomy support ($b = .13, p > .05$). Although these two regression lines emerged as statistically non-significant, it should be noted that the significant interaction term indicated that the difference between the slope lines was statistically significant.

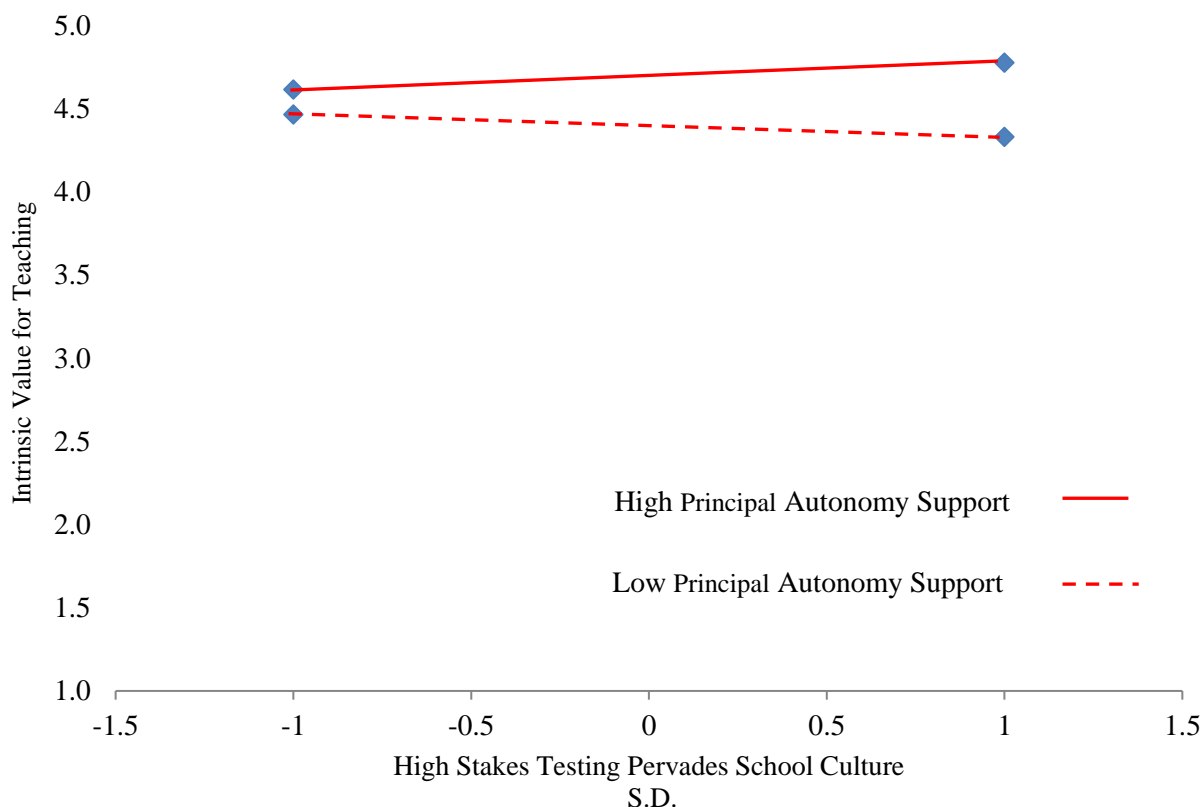


Figure 1: The moderating effect of principal autonomy support on the relation between high-stakes testing pervading school culture and their intrinsic value for teaching.

The second set of regression analyses tested the moderating effect of principal autonomy support on the relations between teachers' perceptions of the degree to which high-stakes testing dictates work roles at their schools with each of the two motivational beliefs. The first step of the regression analyses included teachers' perceptions of the extent to which testing dictates work roles and principal autonomy support. Again, in the second step, an interaction term was entered. A statistically significant interaction was found for the model that included intrinsic value for teaching as the outcome ($F(3, 210)=8.24, \beta=.16, p<.05$; see Table 5).

| Predictor variables | β Step 1 | β Step 2 |
|--|----------------|----------------|
| Step 1 | | |
| High-stakes testing dictates work | -.05 | -.05 |
| Principal autonomy support | .28*** | .24*** |
| Step 2 | | |
| Principal autonomy support X High-stakes testing dictates work | | .16* |
| R^2 | .08*** | .11*** |

Notes: N = 211. β indicates standardized regression coefficient. * $p < .05$. *** $p < .001$.

Table 5: Hierarchical regression predicting intrinsic value for math teaching: high-stakes testing dictates work as predictor.

Again, tests of simple slopes were conducted to understand the nature of the interaction effects. Figure 2 presents two simple regression lines of the regression of intrinsic value for teaching on perceptions of high-stakes testing dictating work roles as a function of two values of principal autonomy support. Teachers' perceptions of high-stakes testing dictating work roles at their schools was a statistically significant negative predictor of intrinsic value for teaching mathematics when teachers perceived their principals as expressing low autonomy support ($b = -.13, p < .05$). Conversely, teachers' perceptions of high-stakes testing dictating work roles at their schools was positively associated with intrinsic value for teaching mathematics when teachers perceived their principals as expressing high autonomy support ($b = .07, p > .05$), however, this relation was not statistically significant.

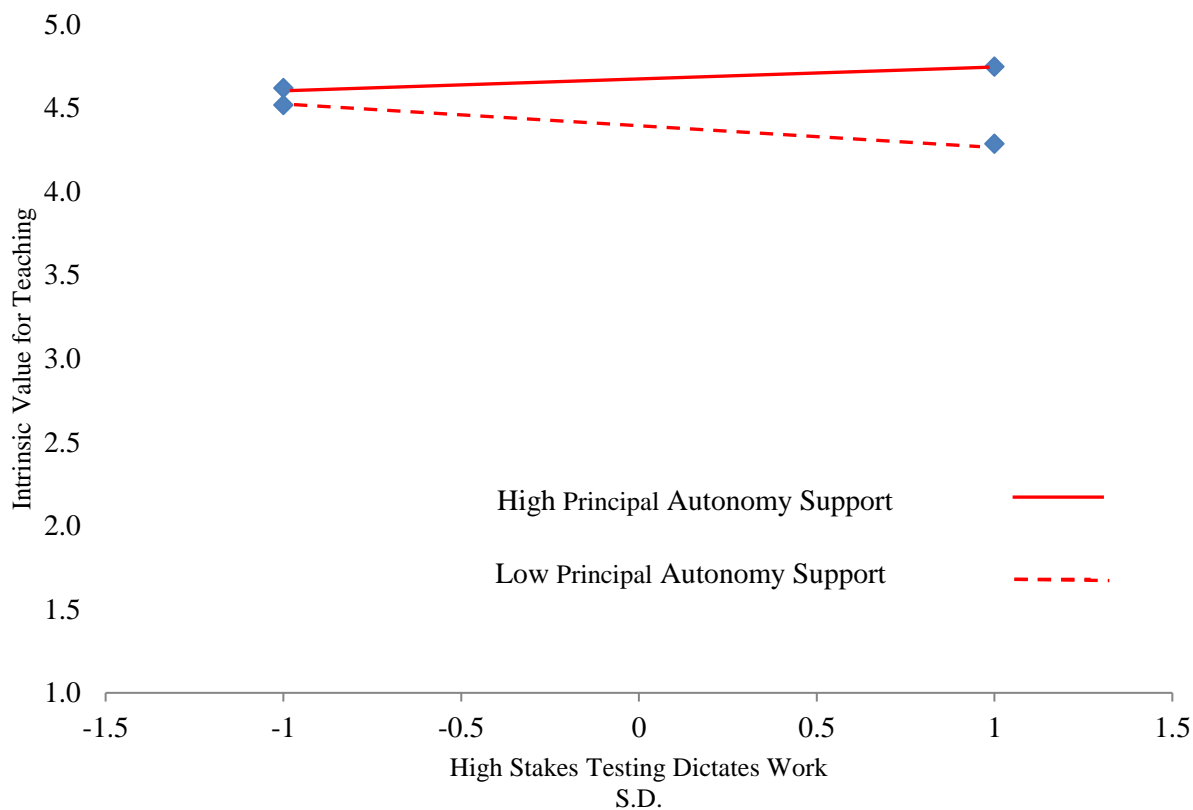


Figure 2: The moderating effect of principal autonomy support on the relation between teachers' perceptions of the extent high-stakes testing dictates work and their intrinsic value for teaching.

Discussion

This study applied a theory of work motivation (SDT) to investigate the effect of school-work contextual factors on motivation for teaching among teachers working in high-poverty school districts. Examining the school-work environmental perceptions and motivational beliefs of teachers working in high-poverty schools is particularly important given research indicating that teachers are more likely to leave schools with a high percentage of low-income students that lack sufficient administrative and collegial support (Simon & Johnson, 2015).

This study adds to the existing teacher research literature in several ways. First, the researchers applied SDT to understand the effect of contextual factors, namely the role of the principal, on teachers' intrinsic value for teaching—a motivational belief that is understudied among teachers (Kunter et al., 2008). Our findings provide support for the use of SDT to understand intrinsic work motivation within school contexts. Second, the researchers addressed a recent call for research to examine whether certain school-work contextual factors 'serve as protective factors against others' (Simon & Johnson, 2015, p. 25) to enhance teacher retention by investigating whether principal autonomy support buffers the effects of a controlling school-work environments on teachers' motivation for teaching. Finally, the researchers have extended qualitative research that has examined teachers' perceptions of high-stakes testing (e.g., Jones & Egley, 2004) by creating items to assess teachers' perceptions of the high-stakes testing environment and the impact these perceptions have on teachers' motivation for teaching.

The School-Work Environment and Teachers' Motivational Beliefs

One of the main findings, based on bivariate correlations, is that teachers' perceptions of the amount of autonomy support provided by their principals are associated with their self-efficacy for teaching (Pearson's $r=.30$, $p<.01$) and intrinsic value for mathematics teaching ($r=.28$, $p<.01$). In addition, teachers' perceptions of their professional fit with their colleagues are associated with their self-efficacy for teaching ($r=.25$, $p<.01$). This finding is consistent with research indicating that the social relationships teachers develop with administrators and with other teachers at their schools enhance their commitment to teaching (e.g., Jones, Yaoungs, & Frank, 2013), especially among those teachers working in high-poverty urban schools (Simon & Johnson, 2015). Current findings also provide further evidence of the importance of mentoring and the promotion of strong interpersonal relationships between teachers and colleagues (Pogodzinski et al., 2013).

After accounting for teachers' professional background, the level of autonomy principals provide teachers remained a significant predictor of self-efficacy for teaching. This finding contrasts the results of Tschannen-Moran and Hoy (2007) who did not find that administrator support through feedback had a significant effect on teachers' self-efficacy for teaching, especially among experienced teachers. Our findings possibly challenge Tschannen-Moran and Hoy's (2007) conclusion because their measure of interpersonal support did not specifically assess the expression of autonomy school leaders provide their teachers. However, our findings are consistent with other studies (e.g., Fernet et al., 2012) that used similar measures of principal autonomy support and provide further insight about the behaviors principals should enact to foster intrinsically motivating work environments for teachers.

A novel result is that after accounting for several teacher professional background factors, principals still played a role in the degree to which teachers enjoyed and were interested in teaching mathematics. This finding is consistent with existing research demonstrating that principals directly and indirectly affect teacher job satisfaction, burnout, and retention (Fernet et al., 2012; Simon & Johnson, 2015; Skaalvik & Skaalvik, 2011). However, by examining the effect of principals on teachers' intrinsic value for teaching mathematics, perhaps the researchers capture a more fine-grained and underlying motivation that precedes teachers' affect about their work and decision-making related to their future in teaching. Moreover, intrinsic value for teaching when compared to job satisfaction may have a more direct and stronger link with teacher quality given that previous research suggests that intrinsic value for teaching is associated with teachers' content and pedagogical knowledge and student learning and motivation (Long & Hoy, 2006; Kunter et al., 2008).

Findings also indicate that principals have a stronger effect on teachers' self-efficacy and intrinsic value for teaching than teacher colleagues do. Principals may have a greater influence on teachers' motivation for teaching because they hold a stronger position of authority and can make decisions that either promote or impede teachers' instructional skill development (Futernick, 2007). Moreover, teachers' colleagues do not have the same level of power as principals in making decisions that will directly affect teachers' freedom to choose how to approach curriculum and instruction in their classroom.

The Moderating Role of Principal Autonomy Support

This study extends research demonstrating the importance of principals in creating a healthy school-work climate that promotes teacher job satisfaction and increases teacher retention (Futernick, 2007; Kraft, Marinell, & Yee, 2015; Simon & Johnson, 2015). Specifically, current findings suggest that principals can mitigate bureaucratic obstacles faced by teachers that may diminish their motivation for teaching. Current results indicate that when teachers perceived principals as providing low levels of autonomy support, the predominance of high-stakes testing at their schools had a negative effect on their intrinsic value for teaching. This negative effect, however, did not emerge when principals provided high levels of autonomy support. These findings support research suggesting that principals have the ability to give power to their teachers by tempering the level of control that federal and state policies related to high-stakes testing has on teachers' curriculum and instructional practices (Futernick, 2007; Noll, 2007). Teachers' intrinsic value for teaching may be influenced by the varying degree to which principals endorse federal and state policies related to high-stakes testing, because these policies can limit the level of autonomy teachers have in designing curriculum and implementing a variety of instructional approaches.

Limitations

While this study adds to understanding the degree to which social factors within the school-work environment are associated with motivation for teaching, several limitations should be addressed. First, the effects of the environment on teachers' motivational beliefs were small. Perhaps this is because the majority of participants were experienced teachers and research has

found that environmental factors play a stronger role on motivation among novice teachers (Tschannen-Moran & Hoy, 2007). Another limitation is that the researchers examined only a few school-work environmental factors and their relation to teachers' motivational beliefs. However, the decision to focus on these factors was based on a well-established motivation theory (Ryan & Deci, 2000). Moreover, the researchers focused on the social aspects of the school environment because these factors relate to teachers' work satisfaction and retention (Simon & Johnson, 2015).

Conclusion

Teachers' motivational beliefs play an integral role in their ability to provide effective instruction and to enhance student motivation and achievement (Klassen & Tze, 2014; Stipek et al., 2001). Thus, based on current findings, it is critical for stakeholders to pay close attention to the organizational context and to find ways to improve the social aspects of the organizational climate in order to develop schools that are hospitable to education. Moreover, given the positive effect of principal leadership on teachers' motivation for teaching that emerged, especially when teachers are dealing with controlling high-stakes testing policies, particular attention should be devoted to developing effective principals who promote a culture of trust that empowers teachers. Future research should explore how principals demonstrate autonomy support for teachers working in low-performing schools dealing with high-levels of pressure to meet accountability standards.

References

- Aiken, L. S., & West, S. T. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications.
- Anderson, R. N., Greene, M. L., & Loewen, P. S. (1988). Relationships among teachers' and students' thinking skills, sense of efficacy, and student achievement. *Alberta Journal of Educational Research*, 34(2), 148–165.
- Au, W. (2011). Teaching under the new Taylorism: High-stakes testing and the standardization of the 21st century curriculum. *Journal of Curriculum Studies*, 43(1), 25–45.
<https://doi.org/10.1080/00220272.2010.521261>
- Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, 34(10), 2045–2068. <https://doi.org/10.1111/j.1559-1816.2004.tb02690.x>
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice Hall.
- Chatzistamatiou, M., Dermitzaki, I., & Bagiatis, V. (2014). Self-regulatory teaching in mathematics: Relations to teachers' motivation, affect and professional commitment. *European Journal of Psychology of Education*, 29, 295–310.
<https://doi.org/10.1007/s10212-013-0199-9>

- Corkin, D., Ekmekci, A., & Papakonstantinou, A. (2015). Antecedents of teachers' educational beliefs about mathematics and mathematical knowledge for teaching among in-service teachers in high poverty urban schools. *Australian Journal of Teacher Education*, 40(9), 31–62. <https://doi.org/10.14221/ajte.2015v40n9.3>
- Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation*, 10, 1–9.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press. <https://doi.org/10.1007/978-1-4899-2271-7>
- Deci, E. L., Connell, J. P., & Ryan, R. M. (1989). Self-determination in a work organization. *Journal of Applied Psychology*, 74(4), 580–590. <https://doi.org/10.1037/0021-9010.74.4.580>
- Ferguson, C. J. (2009). An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice*, 40(5), 532–538. <https://doi.org/10.1037/a0015808>
- Fernet, C., Guay, F., Senécal, C., & Austin, S. (2012). Predicting intraindividual changes in teacher burnout: The role of perceived school environment and motivational factors. *Teaching and Teacher Education*, 28(4), 514–525. <https://doi.org/10.1016/j.tate.2011.11.013>
- Futernick, K. (2007). *A possible dream: Retaining California's teachers so all students learn*. Sacramento: California State University.
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331–362. <https://doi.org/10.1002/job.322>
- Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist*, 41(2), 111–127. https://doi.org/10.1207/s15326985ep4102_4
- Hornstra, L., Mansfield, C., van der Veen, I., Peetsma, T., & Volman, M. (2015). Motivational teacher strategies: the role of beliefs and contextual factors. *Learning Environments Research*, 18(3), 363–392. <https://doi.org/10.1007/s10984-015-9189-y>
- Hoy, A. W. (2008). What motivates teachers? Important work on a complex question. *Learning and instruction*, 18(5), 492–498. <https://doi.org/10.1016/j.learninstruc.2008.06.007>
- Ingersoll, R., Merrill, L., & Stuckey, D. (2014). *Seven trends: The transformation of the teaching force updated April 2014* (CPRE Report #RR-80). Philadelphia: Consortium for Policy Research in Education, University of Pennsylvania.
- Jones, B. D., & Egle, R. J. (2004). Voices from the frontlines: Teachers' perceptions of high-stakes testing. *Education Policy Analysis Archives*, 12(39), 1–29.
- Jones, M. G., Jones, B. D., Hardin, B., Chapman, L., Yarbrough, T., & Davis, M. (1999). The impact of high-stakes testing on teachers and students in North Carolina. *The Phi Delta Kappan*, 81(3), 199–203.
- Jones, N. D., Youngs, P., & Frank, K. A. (2013). The role of school-based colleagues in shaping the commitment of novice special and general education teachers. *Exceptional Children*, 79(3), 365–383. <https://doi.org/10.1177/001440291307900303>
- Kitching, K., Morgan, M., & O'Leary, M. (2009). It's the little things: Exploring the importance of commonplace events for early-career teachers' motivation. *Teachers and Teaching: Theory and Practice*, 15(1), 43–58. <https://doi.org/10.1080/13540600802661311>

- Klassen, R. M., Bong, M., Usher, E. L., Chong, W. H., Huan, V. S., Wong, I. Y., & Georgiou, T. (2009). Exploring the validity of a teachers' self-efficacy scale in five countries. *Contemporary Educational Psychology*, 34(1), 67–76.
<https://doi.org/10.1016/j.cedpsych.2008.08.001>
- Klassen, R. M., & Tze, V. M. (2014). Teachers' self-efficacy, personality, and teaching effectiveness: A meta-analysis. *Educational Research Review*, 12, 59–76.
- Kraft, M. A., Marinell, W. H., & Yee, D. (2015). *School organizational contexts, teacher turnover, and student achievement: Evidence from panel data*. Retrieved from http://www.scholar.harvard.edu/files/mkraft/files/nyc_middle_school_-_school_context_3.12_.pdf
- Kunter, M., Tsai, Y. M., Klusmann, U., Brunner, M., Krauss, S., & Baumert, J. (2008). Students' and mathematics teachers' perceptions of teacher enthusiasm and instruction. *Learning and Instruction*, 18(5), 468–482. <https://doi.org/10.1016/j.learninstruc.2008.06.008>
- Linnenbrink-Garcia, L., Durik, A. M., Conley, A. M., Barron, K. E., Tauer, J. M., Karabenick, S. A., & Harackiewicz, J. M. (2010). Measuring situational interest in academic domains. *Educational and Psychological Measurement*, 70(4), 647–671.
<https://doi.org/10.1177/0013164409355699>
- Long, J. F., & Hoy, A. W. (2006). Interested instructors: A composite portrait of individual differences and effectiveness. *Teaching and Teacher Education*, 22(3), 303–314.
<https://doi.org/10.1016/j.tate.2005.11.001>
- Low, E., Ng, P. Hui, C., & Cai, L. (2017). Teaching as a career choice: Triggers and drivers. *Australian Journal of Teacher Education*, 42(2), 28–46.
<https://doi.org/10.14221/ajte.2017v42n2.3>
- Noll, R. E. (2007). *Teacher job satisfaction in Kentucky: The impact of accountability, principals, and students* (Unpublished doctoral dissertation). University of Cincinnati, OH.
- The Organisation for Economic Co-operation and Development. (2011). *Building a high-quality teaching profession: Lessons from around the world*. Paris: OECD Publishing.
- Olson, L., & Jerald, J. (1998). Quality counts: Barriers to success. *Education Week*, 17(17), 9–23.
- Pogodzinski, B., Youngs, P., & Frank, K. A. (2013). Collegial climate and novice teachers' intent to remain teaching. *American Journal of Education*, 120, 27–54.
<https://doi.org/10.1086/673123>
- Popham, W. J. (2003). The seductive allure of data. *Educational Leadership*, 60(5), 48–51.
- Richardson, P. W., & Watt, H. M. (2010). Current and future directions in teacher motivation research. In S. Karabenick & T. C. Urdan (Eds.), *The decade ahead: Applications and contexts of motivation and achievement, Volume 16B* (pp. 139–173). Bingley, UK: Emerald. [https://doi.org/10.1108/S0749-7423\(2010\)000016B008](https://doi.org/10.1108/S0749-7423(2010)000016B008)
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78.
<https://doi.org/10.1037/0003-066X.55.1.68>
- Simon, N. S., & Johnson, S. M. (2015). Teacher turnover in high-poverty schools: What we know and can do. *Teachers College Record*, 117(3), 1–36.

- Skaalvik, E. M., & Skaalvik, S. (2011). Teacher job satisfaction and motivation to leave the teaching profession: Relations with school context, feeling of belonging, and emotional exhaustion. *Teaching and Teacher Education*, 27(6), 1029–1038. <https://doi.org/10.1016/j.tate.2011.04.001>
- Stipek, D. J., Givvin, K. B., Salmon, J. M., & MacGyvers, V. L. (2001). Teachers' beliefs and practices related to mathematics instruction. *Teaching and Teacher Education*, 17(2), 213–226. [https://doi.org/10.1016/S0742-051X\(00\)00052-4](https://doi.org/10.1016/S0742-051X(00)00052-4)
- Thomas, R. M. (2005). *High-stakes testing: Coping with collateral damage*. Mahwah, NJ: Lawrence Erlbaum.
- Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, 17(7), 783–805. [https://doi.org/10.1016/S0742-051X\(01\)00036-1](https://doi.org/10.1016/S0742-051X(01)00036-1)
- Tschannen-Moran, M., & Hoy, A. W. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and Teacher Education*, 23(6), 944–956. <https://doi.org/10.1016/j.tate.2006.05.003>
- Watt, H. M. (2006). The role of motivation in gendered educational and occupational trajectories related to math. *Educational Research and Evaluation*, 12(4), 305–322. <https://doi.org/10.1080/13803610600765562>
- Watt, H. M., & Richardson, P. W. (2007). Motivational factors influencing teaching as a career choice: Development and validation of the FIT-Choice scale. *The Journal of Experimental Education*, 75(3), 167–202. <https://doi.org/10.3200/JEXE.75.3.167-202>
- Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25(1), 68–81. <https://doi.org/10.1006/ceps.1999.1015>
- Wolters, C. A., & Daugherty, S. G. (2007). Goal structures and teachers' sense of efficacy: Their relation and association to teaching experience and academic level. *Journal of Educational Psychology*, 99(1), 181–193. <https://doi.org/10.1037/0022-0663.99.1.181>
- Youngs, P., Pogodzinski, B., Grogan, E., & Perrone, F. (2015). Person-organization fit and research on instruction. *Educational Researcher*, 44(1), 37–45. <https://doi.org/10.3102/0013189X15569531>

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